

TRENDS, TREND SETS AND TIME-HEIGHT TRENDS MODE


Another tool is the **Trends** mode button on the image tool bar. Trend windows allow you to observe algorithm output for specific severe storm features over time.

There are three types of trends:

1. **Individual Trend Windows**, which allow you to choose just one trended parameter at a time;
2. **Trend Sets**, which are grouped in convenient ways for viewing several trends at a time specific to severe weather events; and
3. **Time-Height Trends**, which allow you to examine the height and attributes of a specific MDA, SCIT, and DDPDA parameters over time.

There are many trends, trend sets, and time-height trend windows available. They are most useful when used in conjunction with algorithm overlays and tables.

To use any of the trends, trend sets, or time-height trends:

1. Click on the  button on the **image window** of interest.
2. After noting the information on the **Help Bar**, which lists mouse functions, click near an algorithm icon of interest in the image area with the appropriate mouse button.

Pressing the **<left-mouse>** button on the image will display a **trend set** window for the storm or event selected.

Pressing the **<right-mouse>** button will display an **individual trend** window for the storm or event selected.

Pressing the **<middle-mouse>** button will display a **time-height trend** window for the storm or event selected.

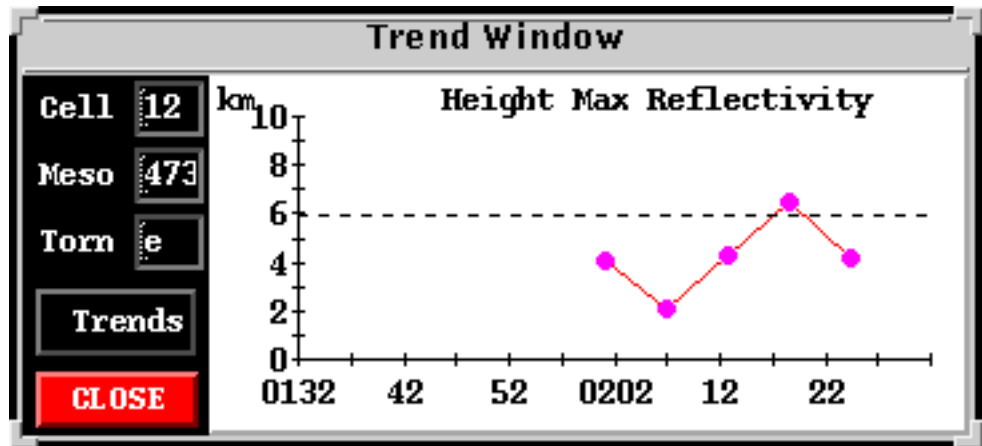
The **trend**, **trend set**, or **time-height trend window** will appear. Check the Cell, Meso, Tornado ID and 88D Cell number to make sure the desired number or letter of the feature is displayed. If not, click in the appropriate ID box and change the number ID. Press ↵ after entering a new number.

3. Click on the **Sets** or **Trends** button on the trend window selected, and a pull-down menu will appear.
4. Choose the desired trend(s) by clicking with the **<left-mouse>** button on the **Sets** or **Trends** pull-down menu. If no trend exists, the trend window will say "No Trend." This means that data were not generated by the algorithm for that volume scan.

INDIVIDUAL TRENDS <Right-Mouse>

To choose an individual trend window, in Trends mode, click the <right-mouse> button on the cell, meso, or torn algorithm icon you wish to trend. (Figure 3.12).

Figure 3.12:
Example Individual
Trend Window



Individual trends have four main categories: *Cell*, *Hail*, *Mesocyclone*, and *Tornado*, all accessed through the **Trends** button. Each is listed below, with a brief explanation for those titles that are not self-explanatory. The x-axis is always time, and covers up to 60 minutes. The y-axis displays an absolute scale for each parameter.

Cell Submenu - Individual Trends (NSSL SCIT Algorithm)

- Maximum Reflectivity
- Height of Maximum Reflectivity
- Storm Base
- Storm Top
- Storm Mass
- Storm-Relative Helicity
- Vertically Integrated Liquid
- Cell Volume
- Core Aspect Ratio
- Center of Mass Height - 3D centroid of water
- Maximum Convergence - Maximum convergence in mid-altitude of a storm.
- Depth of Convergence - vertical depth of 3D convergence field.

Hail Submenu - Individual Trends (NSSL Hail Detection Algorithm)

- Hail Probability
- Severe Hail Index
- Maximum Hail Size
- Severe Hail Probability
- Storm-Top Divergence

Mesocyclone Submenu-Individual Trends (NSSL Mesocyclone Detection Algorithm)

Mesocyclone Base - Height of the mesocyclone base

Mesocyclone Top - Height of the mesocyclone top

Mesocyclone Depth

Low-Altitude diameter - Diameter at lowest altitude with a signature detection base)

Low-Altitude Rotational Velocity

Maximum Rotational Velocity

Height of Maximum Rotational Velocity

Low-Altitude Shear

Maximum Shear - Maximum anywhere in the vertical column

Height of Maximum Shear

Low-Altitude Gate-to-Gate - Velocity difference in two adjacent azimuths in circulation

Maximum Gate-to-Gate - Velocity difference in two adjacent azimuths in circulation

Height of Maximum Gate-to-Gate

Strength Rank

Mesocyclone Strength Index

Probability of Tornado associated with circulation based on Neural Network function

Probability of Severe Weather (hail > 3/4 inch, winds > 50 kts, or tornado) associated with circulation based on Neural Network function

Tornado Submenu - Individual Trends (NSSL Tornado Detection Algorithm)

TVS Base - Height of the tornadic signature base

TVS Top - Height of the tornadic signature top

TVS Depth - Depth of the tornadic signature

Low-Altitude Velocity Differences - at base (across two azimuths)

Maximum Velocity Difference - Maximum 2D difference within the vertical column

Height Max Vel Diff - Height of the maximum velocity difference

TREND SETS (<left-mouse>)

To obtain a trend set, in Trends mode, click next to the desired cell, mesocyclone, or tornado algorithm icon. (Figure 3.13) As stated before, Trend Sets are conveniently grouped according to weather phenomena:

CELL1 First group of storm cell trends
(from the **NSSL SCIT**)

CELL2 Second group of storm cell trends
(from the **NSSL SCIT**)

HAIL Hail group of trends (from the
NSSL Hail Detection Algorithm)

MDA1 First group of mesocyclone trends
(from **NSSL Mesocyclone Detection Algorithm**)

MDA2 Second group of mesocyclone trends
(from **NSSL Mesocyclone Detection Algorithm**)

TORN Tornado group (from **NSSL Tornado Detection Algorithm**)

Turn on the **NSSL Meso**, **NSSL Cell ID**, and/or **NSSL Tornado ID's** overlays on the radar images to help you in using Trends.

Trend sets, like algorithm output tables, are RAM (memory) intensive. Close trend and algorithm output windows when finished to free the memory.

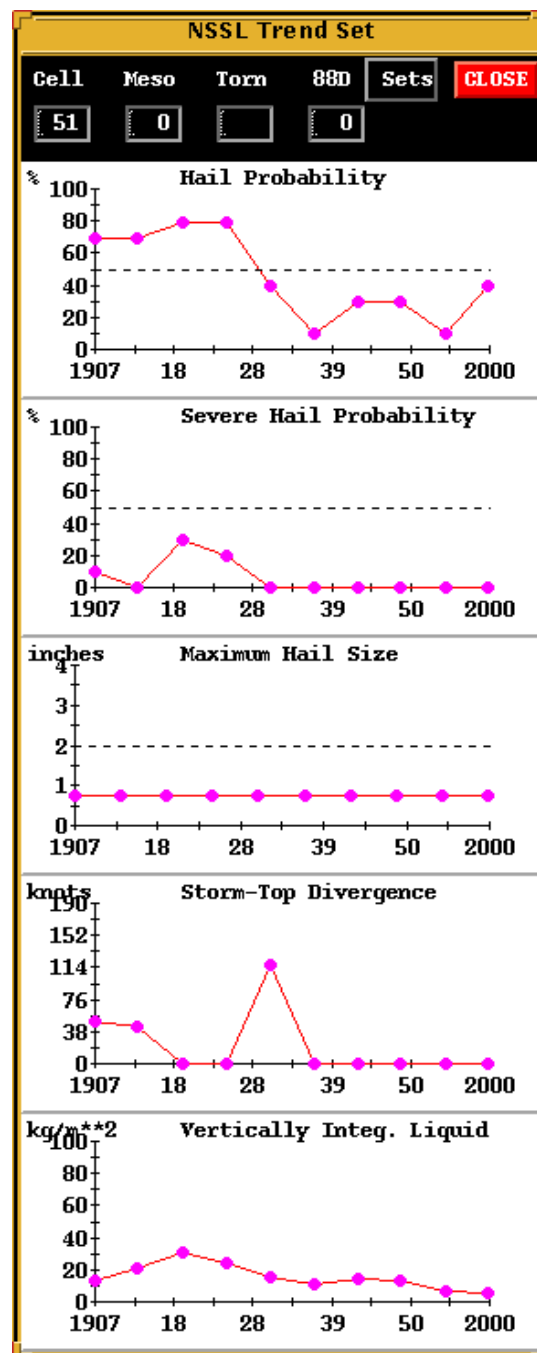


Figure 3.13: Example of a Hail Trend Set

Below is a listing of trends in each set::

CELL Set 1:

The CELL set of trends displays important storm cell output from the **NSSL SCIT Algorithm**:

- Maximum Convergence in the mid-altitudes of the storm (1-8km)
- Depth of Convergence
- Height of Maximum Reflectivity
- Center of Mass Height
- Storm-Top Divergence

CELL Set 2:

The CELL set of trends displays important storm cell output from the **NSSL SCIT Algorithm**:

- Maximum Convergence in the mid-altitudes of the storm (1-8km)
- Depth of Convergence
- Height of Maximum Reflectivity
- Center of Mass Height
- Storm-Top Divergence

HAIL Set:

The HAIL Set of trends displays output from the **NSSL Hail Detection Algorithm**. The trends included in the set are:

- Hail Probability
- Severe Hail Probability
- Maximum Hail Size
- Storm-Top Divergence
- Cell-Based Vertically Integrated Liquid (VIL)